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PANAMANIAN SPIDERS OF THE GENUS *TMARUS*  
(ARANEAE THOMISIDAE)

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No. 7.—*Panamanian Spiders of the Genus Tmarus*  
(*Araneae, Thomisidae*)

By ARTHUR M. CHICKERING

The Pickard-Cambridges (1889–1905) recognized seven species of *Tmarus* from Panama. Petrunkevitch (1925) reported only a single immature specimen of the genus from Panama. Banks (1929) reported two species now regarded as *T. ineptus* O.P.-Cambridge and *T. studiosus* O.P.-Cambridge. As a result of my earlier study of the genus (1950) I was able to recognize eighteen species. Four of these were known only from females, seven known only from males, with the remaining seven probably known from both sexes. Roewer (1954) listed twenty species known from Panama. This list includes *T. separatus* Banks and *T. interritus* Keyserling, but this inclusion seems to have been an error. *T. separatus* Banks is apparently known only from Mexico and *T. interritus* Keyserling only from Brazil. Since the publication of my previous paper on this genus (1950), I have collected spiders in Panama during four additional periods as a result of which I have accumulated a considerable number of specimens in this generic group. These have been completely worked over with the result that I am now compelled to recognize twelve additional species, thus making a total of thirty species known from this small area. It continues to be very difficult to match up males and females correctly and I am obliged to state that I have some doubts concerning the accuracy with which this has been done in the past.

As I have frequently stated in my published papers, I am deeply grateful for the many privileges extended to me by the staff of the Museum of Comparative Zoology, Harvard University, over a period of many years. My studies could never have been continued without this aid and encouragement. Special acknowledgements should be extended to Dr. Ernst Mayr, Director; Dr. P. J. Darlington, Jr., Alexander Agassiz Professor of Zoology; and Dr. Herbert W. Levi, Associate Curator of Arachnology.

Grant No. GB-1801 from the National Science Foundation made it possible for me to spend seven months making collections of spiders in the West Indies and Panama during the latter part of 1963 and the first five months of 1964. This grant is also making it possible for me to continue my studies at the Museum of Comparative Zoology for a considerable period. A Guggenheim Fellowship made it possible for me to collect in Jamaica, W. I., and in Panama, in 1957 and 1958, and also to spend four months in the

British Museum (Natural History) studying important collections. Dr. G. Owen Evans and Mr. D. J. Clark, Department of Zoology (Arachnida), British Museum (Natural History), have recently loaned me important specimens of the genus *Tmarus* for study in the preparation of this paper.

All types named in this publication together with all other specimens of the genus *Tmarus* in my personal collection will be deposited in the Museum of Comparative Zoology, Harvard University.

#### Genus *TMARUS* Simon, 1875

The type species of the genus is *Tmarus piger* (Walckenaer), 1802; widely distributed in Europe and Asia. The genus is cosmopolitan in distribution and is most abundant in the neotropical region.

In addition to the general family characteristics, generic features common to the species from Panama may be stated as follows: Chelicerae without teeth; only slightly porrect; essentially parallel. Lip much longer than wide at base. Eyes: eight in two rows; viewed from above, posterior row definitely recurved, anterior row slightly so; lateral eyes larger than medians, on well defined tubercles; posterior tubercles the larger; central quadrangle usually wider behind than long and wider behind than in front. Clypeus porrect, often conspicuously so; height equal to several diameters of AME. Carapace usually abruptly declined to posterior border; without a median thoracic groove or fovea. Legs: spinose; usually 1243 in order of length but occasionally 2143 or other minor deviation; one and two nearly equal in length and longer than three and four which are also nearly equal in length. Tarsal claws toothed; palpal claw in females also toothed. Abdomen often with a posterior tubercle or other modification; with many short, stiff spines and spinules. Male palpi usually well supplied with apophyses, and female epigyna usually well defined and often complicated. To conserve space certain features possessed in common by all species under consideration will not be specifically mentioned in the technical descriptions of new species in this paper. For the same reason a more concentrated description than usual in my published papers will be adopted in this and succeeding publications. When eyes are referred to by the abbreviations AME, ALE, PME and PLE, the anterior medians, anterior laterals, posterior medians and posterior laterals are respectively designated.

A complete list of the species of the genus *Tmarus* from Panama as they are now recognized may be given as follows: *Tmarus aculeatus* Chickering; *T. bucculentus* Chickering; *T. cognatus* Chickering; *T. contortus* Chickering; *T. corruptus* O. P.-Cambridge; *T. cretatus* sp. nov.; *T. curvus* Chickering; *T. decens* O. P.-Cambridge; *T. decorus* sp. nov.; *T. humphreyi* sp. nov.; *T. impedus* sp. nov.; *T. ineptus* O. P.-Cambridge; *T. innotus* sp. nov.; *T. innumus* sp. nov.; *T. intentus* O. P.-Cambridge; *T. levii* sp. nov.; *T. longus* sp. nov.; *T. morosus* Chickering; *T. mundulus* O. P.-Cambridge; *T. obsecus* sp. nov.; *T. parki* Chickering; *T. pauper* O. P.-Cambridge; *T. peregrinus* Chickering; *T. probus* Chickering; *T. productus* Chickering; *T. protobius* sp. nov.; *T. rubinus* sp. nov.; *T. sigillatus* Chickering; *T. studiosus* O. P.-Cambridge; *T. vitus* sp. nov. Ten of the species listed above are known only from males; ten species are known only from females; the remaining ten are probably known from both sexes.

#### Key to the males of known species of *Tmarus* from Panama

1. Species with embolus definitely and conspicuously curled either at anterior end of bulb on ventral side or on retrolateral side (*contortus*, *curvus*, *morosus*, *productus*) . . . . . 2
- 1a. Species with embolus either extended more or less around the margin of bulb and not definitely curled or, apparently, restricted to anterior end of bulb (*aculeatus*, *cretatus*, *decorus*, *humphreyi*, *ineptus*, *innotus*, *intentus*, *mundulus*, *obsecus*, *parki*, *pauper*, *peregrinus*, *probus*, *sigillatus*, *studiosus*, *vitus*) . . . . . 5
2. Palpal tibial apophyses short, only ventral one strongly chitinized; cymbium deeply excavate at retrolateral basal corner; embolus deeply grooved, arises near middle of anterior border of bulb, makes a complete retrolateral circle and then loops across middle of bulb again (fig. 4, 1950) . . . . . *T. contortus*
- 2a. Palpal features not as given above (*curvus*, *morosus*, *productus*) . . . . . 3
3. Palp: tibia deeply excavate retrolaterally and distally; with a strongly chitinized apophysis of moderate length ventral to excavation; embolus makes a complete circle distal to anterior margin of bulb, then passes retrolaterally to terminate in a finely dentate tip (fig. 7, 1950) . . . . . *T. curvus*
- 3a. Without palpal features as given above (*morosus*, *productus*) . . . . . 4
4. Palp: ventral, retrolateral, tibial apophysis strongly chitinized and distally knobbed; dorsal apophysis a sharply pointed spine; near anterior margin of bulb the embolus turns toward base, then passes to retrolateral side and extends nearly to tip of cymbium as a long, slender filament (figs. 13-14, 1950) . . . . . *T. morosus*
- 4a. Palp: with a pair of long, slender, retrolateral, tibial apophyses almost meeting distally, with a hook attached near base of the shorter apophysis; deeply grooved embolus makes a loop near distal margin of bulb,

- then a second loop near base of bulb, continues as a fine filament to distal end of cymbium (fig. 25, 1950) . . . . . *T. productus*
5. Palp: species with at least the dorsal retrolateral, tibial apophysis elongated and well developed (*aculeatus*, *cretatus*, *decorus*, *humphreyi*, *parki*, *peregrinus*, *probus*, *studiosus*, *vitusus*) . . . . . 6
- 5a. Palp: species with retrolateral tibial apophyses less well developed; either with but one apophysis or with two shorter and poorly developed apophyses (*ineptus*, *intentus*, *innotus*, *mundulus*, *obsecus*, *pauper*, *sigillatus*) . . . . . 14
6. Palp: with a retrolateral, dorsal, tibial apophysis extending nearly to tip of bulb (*aculeatus*, *decorus*) . . . . . 7
- 6a. Palp: with a retrolateral, dorsal, tibial apophysis extending at most little beyond middle of bulb (*cretatus*, *humphreyi*, *parki*, *peregrinus*, *probus*, *studiosus*, *vitusus*) . . . . . 8
7. Palp: with the dorsal, retrolateral, tibial apophysis distally bifurcated (fig. 1, 1950) . . . . . *T. aculeatus*
- 7a. Palp: with the dorsal, retrolateral, tibial apophysis simple at tip, not bifurcated (Figs. 7-8) . . . . . *T. decorus*
8. Palp: with the dorsal, retrolateral, tibial apophysis subdivided near its base into a short, pointed process and a long, pointed extension (figs. 29-30, 1950) . . . . . *T. studiosus*
- 8a. Palp: without any basal division of the dorsal, retrolateral, tibial apophysis (*cretatus*, *humphreyi*, *parki*, *peregrinus*, *probus*, *vitusus*) . . . . . 9
9. Palp: with the dorsal, retrolateral, tibial apophysis definitely serrated along its external edge near middle (fig. 23, 1950) . . . . . *T. probus*
- 9a. Palp: without any serration along external edge of dorsal, retrolateral, tibial apophysis (*cretatus*, *humphreyi*, *parki*, *peregrinus*, *vitusus*) . . . . 10
10. Palp: with the ventral, retrolateral, tibial apophysis a relatively massive structure, deeply notched at distal end (Fig. 10) . . . . . *T. humphreyi*
- 10a. Palp: with the ventral, retrolateral, tibial apophysis relatively smaller and unnotched at its distal end (*cretatus*, *parki*, *peregrinus*, *vitusus*) . . 11
11. Palp: dorsal, retrolateral, tibial apophysis with two nearly right angles in its total length (fig. 20, 1950) . . . . . *T. parki*
- 11a. Palp: with dorsal, retrolateral, tibial apophysis not provided with right-angled bends (*cretatus*, *peregrinus*, *vitusus*) . . . . . 12
12. Palp: dorsal, retrolateral, tibial apophysis flask-like in shape (fig. 22, 1950) . . . . . *T. peregrinus*
- 12a. Palp: dorsal, retrolateral, tibial apophysis not flask-like in shape (*cretatus*, *vitusus*) . . . . . 13
13. Palp: dorsal, retrolateral, tibial apophysis elongated; ventral, tibial apophysis definitely hammer-headed (Figs. 1-2) . . . . . *T. cretatus*
- 13a. Palp: dorsal, retrolateral, tibial apophysis robust, with a very slender terminal spine; ventral, retrolateral apophysis short, broad, slightly indented terminally . . . . . *T. vitusus*
14. Palp: with a definitely recurved hook at base of tarsal bulb (fig. 28, 1950) . . . . . *T. sigillatus*
- 14a. Palp: tarsal bulb without any definite recurved hook at its base (*ineptus*, *intentus*, *innotus*, *mundulus*, *obsecus*, *pauper*) . . . . . 15

15. Palp: with a pair of short, pointed processes emerging from a rounded depression at anterior end of bulb (fig. 10, 1950).....*T. ineptus*
- 15a. Palp: bulb without such structures as given above (*intentus*, *innotus*, *mundulus*, *obsecus*, *pauper*).....16
16. Palp: tarsal bulb with a single, bifurcated process emerging from a rounded depression at anterior end (F. P.-Cambridge's fig. 26, table 10).....*T. intentus*
- 16a. Palp: tarsal bulb without such a structure as given above (*innotus*, *mundulus*, *obsecus*, *pauper*).....17
17. Palp: ventral, retrolateral, tibial apophysis a short, blunt process; considerably longer than very short, dorsal, retrolateral apophysis (figs. 16-17, 1950).....*T. mundulus*
- 17a. Palp: tibial apophyses not as given above (*innotus*, *obsecus*, *pauper*)..18
18. Palp: both tibial apophyses short, bluntly pointed processes (O. P.-Cambridge's fig. 8, table 12).....*T. pauper*
- 18a. Palp: retrolateral, tibial apophyses unlike those given above (*innotus*, *obsecus*).....19
19. Posterior fourth of abdomen sharply constricted but with no discernible tubercle (Fig. 27).....*T. obsecus*
- 19a. Abdomen with no marked constriction; with a small but distinct dorsal tubercle in last quarter.....*T. innotus*

No satisfactory key has yet been devised to aid in the identification of females of known species from Panama.

#### TMARUS ACULEATUS Chickering

*Tmarus aculeatus* Chickering, 1950. Bull. Mus. Comp. Zool., 103(4): 217, fig. 1. The male holotype from Barro Colorado Island, C. Z., together with several male paratypes from localities in the Panama Canal Zone and nearby parts of Panama are all in the Museum of Comparative Zoology. Roewer, 1954; Bonnet, 1959.

Since 1950 the species has been taken only on Barro Colorado Island, C. Z., Summit, C. Z., and Arraijan, R. P. The female is still unknown.

#### TMARUS BUCCULENTUS Chickering

*Tmarus bucculentus* Chickering, 1950, Bull. Mus. Comp. Zool., 103(4): 220, fig. 2. The female holotype from Ft. Randolph, Panama Canal Zone, August, 1936, together with a female paratype, are in the Museum of Comparative Zoology. Roewer, 1954; Bonnet, 1959.

This species, known only from females, has been collected in three different localities in the Canal Zone since my publication in 1950.

## TMARUS COGNATUS Chickering

*Tmarus cognatus* Chickering, 1950, Bull. Mus. Comp. Zool. 103(4): 222, fig. 3. The female holotype and two female paratypes from the Panama Canal Zone Forest Preserve, August, 1939, are in the Museum of Comparative Zoology. Roewer, 1954; Bonnet, 1959.

This species, also known only from females, has not been taken since the original specimens were collected.

## TMARUS CONTORTUS Chickering

*Tmarus contortus* Chickering, 1950, Bull. Mus. Comp. Zool., 103(4): 224, figs. 4-5. The male holotype, female paratype, one male paratype and three immature specimens, all taken in the Madden Dam region, Panama Canal Zone, August, 1939, are in the Museum of Comparative Zoology. Roewer, 1954; Bonnet, 1959.

A very small number of both sexes have been taken since the establishment of the species and all have come from the Canal Zone Forest Preserve.

## TMARUS CORRUPTUS O. P.-Cambridge

*Tmarus corruptus* O. P.-Cambridge, 1892, Arachnida-Araneida, 1: 95, pl. 12 fig. 10. The holotype female from Bugaba, Panama, is in the British Museum (Natural History). F. P.-Cambridge, 1900; Chickering, 1950; Roewer, 1954; Bonnet, 1959.

This species remains poorly known and only from females. The elder P.-Cambridge had the holotype from Bugaba, Panama; F. P.-Cambridge believed that he had the species from Mexico. It has not yet appeared in my collections. A female on loan from the British Museum (Natural History) does not show the two pairs of minute canals drawn so clearly by F. P.-Cambridge. O. P.-Cambridge's figure 10c, plate 12, is nearer to what I see in the epigynum than what is shown in F. P.-Cambridge's figure 32, plate 10. In view of the uncertainties here and the scarcity of material I am reserving further treatment of the species pending the acquisition of more specimens for a comparative study.

## TMARUS CRETATUS sp. nov.

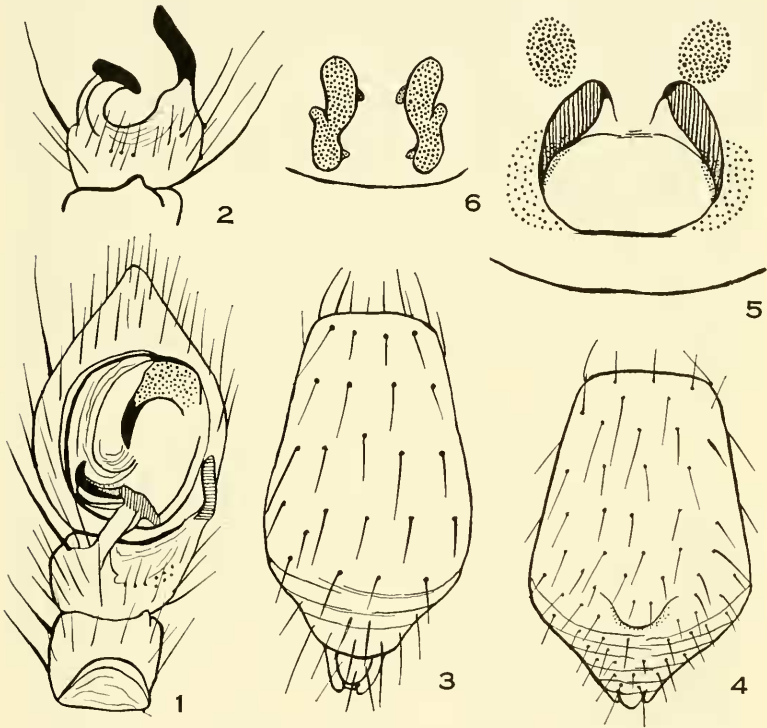
## Figures 1-6

The specific name is a Latin adjective suggested by the chalky appearance of the body.

*Male holotype.* Total length, including slightly porrect chelicerae, 3.84 mm. Carapace 1.49 mm long, 1.56 mm wide opposite



interval between second and third coxae where it is widest; 0.47 mm tall and, therefore, less than  $\frac{1}{3}$  as tall as wide. Eyes: viewed from above, posterior row strongly recurved, anterior row gently so; central ocular quadrangle wider behind than in front in ratio of 13 : 10, longer than wide behind in ratio of 15 : 13; posterior row occupies about  $\frac{9}{13}$  of width of carapace at that level; ratio of eyes AME : ALE : PME : PLE = 5.5 : 12 : 4.5 : 13; AME separated from one another by nearly twice their diameter, from ALE by a little more than twice their diameter; PME separated from one another by a little less than four times their



*Tmarus cretatus* sp. nov.

- Fig. 1. Left palp of male, ventral view.  
 Fig. 2. Left palpal tibia, retrolateral view.  
 Fig. 3. Dorsal view of abdomen of male.  
 Fig. 4. Dorsal view of abdomen of female.  
 Fig. 5. Epigynum, from below.  
 Fig. 6. Spermathecae of female paratype, cleared and turned outward to show internal arrangement.

diameter, from PLE by six times their diameter; laterals separated by  $2\frac{1}{4}$  times the diameter of ALE. Height of clypeus equal to  $4\frac{1}{4}$  times the diameter of AME. Legs 1234. Palp: essential features shown in Figures 1-2; tibial apophyses quite distinctive. Abdomen: posterodorsal tubercle, prominent in the female, appears here as only a slight rise. Color in alcohol: general chalky appearance important; first two pairs of femora with numerous white flecks on prolateral surfaces; venter of abdomen with a median, longitudinal, light brownish stripe and a narrow, white stripe on each side (in some paratypes the median stripe is nearly black).

*Female paratype.* Total length, including bases of chelicerae and slightly extended posterior spinnerets, 5.84 mm. Carapace 2.08 mm long, 2.21 mm wide opposite interval between second and third coxae where it is widest. Clypeus somewhat more porrect than in male; height equal to five times the diameter of AME. Legs 1243. Abdomen: with a prominent posterodorsal tubercle as indicated in Figure 4. Epigynum: essentially as shown in Figures 5-6. Color: essentially as in male; median, ventral, abdominal stripe is dark brown.

*Type locality.* The male holotype is from Summit, Panama Canal Zone, July, 1950; the female paratype was taken in the same locality in August, 1950. One male paratype was taken at Summit, C. Z., July, 1950; several female paratypes are in the collection from Summit, C. Z., July and August, 1950, and Summit Gardens, C. Z., August, 1954.

### TMARUS CURVUS Chickering

*Tmarus curvus* Chickering, 1950, Bull. Mus. Comp. Zool., 103(4): 228, figs. 7-8. The male holotype and female paratype were taken on Barro Colorado Island, Panama Canal Zone, August, 1936. Paratypes of both sexes were reported from several localities in the Canal Zone and in Panama proper; all specimens are in the Museum of Comparative Zoology. Roewer, 1954; Bonnet, 1959.

The species has been collected during two recent collecting periods in the Canal Zone.

### TMARUS DECENS O. P.-Cambridge

*Tmarus decens* O. P.-Cambridge, 1892, Arachnida-Araneida, 1: 98, pl. 12, fig. 9. The holotype female is in the British Museum (Natural History). F. P.-Cambridge, 1900; Chickering, 1950; Roewer, 1954; Bonnet, 1959.

This species, known only from the female, has not yet appeared in my collections and is known only from Bugaba, Panama.

## TMARUS DECORUS sp. nov.

## Figures 7-8

The specific name is a Latin adjective suggested by the decorative pattern on the cephalothorax and dorsal areas of the abdomen.

*Male holotype.* Total length, including somewhat porrect chelicerae, to tip of anal tubercle 4.39 mm. Carapace 1.69 mm long; 1.5 mm wide opposite second coxae where it is widest; about 0.68 mm tall and, therefore, less than half as tall as wide. Eyes: viewed from above, posterior row strongly recurved, anterior row slightly so; viewed from in front, anterior row almost straight, measured by centers; central ocular quadrangle wider behind than in front in ratio of about 16 : 11; about as wide behind as long. Ratio of eyes AME : ALE : PME : PLE = 5 : 11 : 6.5 : 10. AME separated from one another by nearly 2.5 times their diameter, from ALE by three times their diameter. PME separated from one another by slightly less than three times their diameter, from PLE by nearly 4.5 times their diameter. Laterals separated by nearly three times the diameter of PLE. Clypeus quite porrect; height equal to about seven times the diameter of AME (only chitinized area measured); apparently bearing only a single, slender spine at each ventrolateral angle. Sternum: sternal suture gently recurved; not extended between fourth coxae which are separated by about three-fourths of their width. Legs: 1243; with numerous long, slender spines. Palp: most essential features shown in Figures 7-8; patella and tibia short; the latter with two conspicuous apophyses. Abdomen: a slight swelling may indicate a more or less prominent posterodorsal tubercle in the female when the latter is known; with numerous long, slender spines; only a little more than twice as long as wide. Color in alcohol: carapace yellowish with red and pink decorations; a narrow red marginal band nearly encircles this part of the body from opposite the interval between LE to posterior border where there is a central gap in the colored margin; within the dorsal area there is an irregular, bright red figure consisting of a series of short radii surrounding a yellowish area; the clypeus bears a pair of relatively large, irregular, reddish spots; the chelicerae are yellowish with a central pink spot on each; legs basically yellowish but with many small red or pink dots and larger reddish blotches; fourth leg and, to a lesser extent, the third leg with the reddish dots united into narrow stripes especially on the patellae and tibiae; abdomen with a series of reddish and white transverse bands extending laterally and posteriorly; the venter is yellowish with a dusty brown center.

*Type locality.* The holotype male is from Barro Colorado Island, Panama Canal Zone, February, 1958. There are no paratypes and the female is unknown.

TMARUS HUMPHREYI sp. nov.

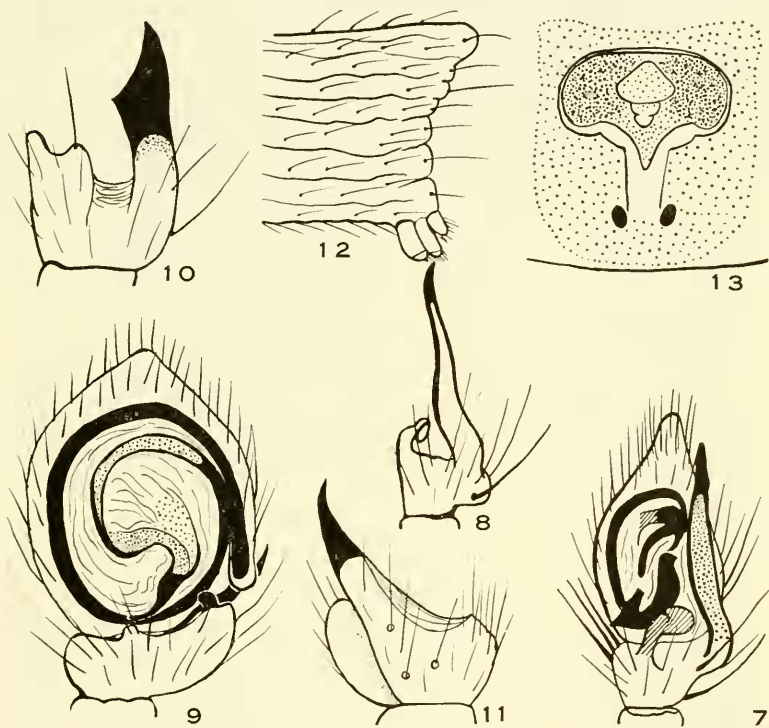
Figures 9-13

For some time the males and females here regarded as representing one species were considered as two. Recently, however, after studying the paratypes of both sexes it was decided that it would be safe to combine them. The species is named in honor of Richard L. Humphrey, M. D., a former student of mine and a delightful companion on an extended collecting trip in Panama.

*Male holotype.* Total length, including somewhat porrect chelicerae, 3.74 mm. Carapace 1.39 mm long, 1.19 mm wide opposite anterior border of first pair of legs; 0.55 mm tall and, therefore, a little less than half as tall as wide. Eyes: viewed from above, posterior row rather strongly recurved, anterior row gently so; viewed from in front, anterior row nearly straight, measured by centers; central ocular quadrangle wider behind than in front in ratio of 25 : 18, longer than wide behind in ratio of 27 : 25; posterior row occupies nearly four-fifths of width of carapace at that level. Ratio of eyes AME : ALE : PME : PLE = 5 : 10 : 6.5 : 9. AME separated from one another by twice their diameter, from ALE by a slightly greater distance. PME separated from one another by slightly more than twice their diameter, from PLE by about 3.5 times their diameter. Laterals separated by about twice the diameter of PLE. Clypeus: quite porrect; with seven long, slender spines along ventral border; height, including membranous border, equal to nearly six times the diameter of AME. Chelicerae and maxillae essentially typical of the genus. Sternum: bluntly terminated posteriorly and only slightly extended between fourth coxae which are separated by about two-thirds of their width; otherwise essentially typical of the genus. Legs: 1243. Palp: most essential features shown in Figures 9-11. Abdomen: almost squarely truncate at anterior dorsal border; a small posterodorsal tubercle is curved downward; dorsum with numerous slender spines each arising from a small, basal tubercle. Color in alcohol: carapace reddish brown with many irregular, dark, oblique stripes along lateral sides; legs yellowish with fine, black dotting; sternum brownish with darker spots extending from coxae toward the center; abdomen a dull black dorsally with a narrow, central, yellowish stripe extending through the anterior half; lateral sides of abdomen with alternating, irregularly narrow,

dark and light stripes; venter with a broad, nearly black, central stripe and a narrow, irregular light stripe on each side.

*Female paratype.* Total length 5 mm, including bases of somewhat porrect chelicerae; carapace 1.76 mm long, 1.45 mm wide opposite second coxae, 0.84 mm tall and, therefore, a little more than half as tall as wide, with the usual supply of long, slender spines. Eyes: central ocular quadrangle wider behind than in front in ratio of 15 : 11; about as long as wide behind; ratio of eyes



*Tmarus decorus* sp. nov.

Fig. 7. Tibia and tarsus of left male palp, ventral view.

Fig. 8. Tibia and tarsus of left male palp, retrolateral view.

*Tmarus humphreyi* sp. nov.

Fig. 9. Tibia and tarsus of left male palp, ventral view.

Fig. 10. Tibia and tarsus of left male palp, retrolateral view.

Fig. 11. Tibia and tarsus of left male palp, dorsal view.

Fig. 12. Posterior end of abdomen of female.

Fig. 13. Epigynum from below.

AME : ALE : PME : PLE = 5 : 10 : 6 : 8.5; AME separated from one another by 2.6 times their diameter, from ALE by nearly three times their diameter; PME separated from one another by slightly less than three times their diameter, from PLE by nearly  $14/3$  of their diameter; laterals separated by 2.2 times the diameter of ALE. Clypeus: strongly porrect; height, including membranous ventral border, equal to slightly more than six times the diameter of AME. Legs: 1243. Abdomen: with a short posterodorsal tubercle (Fig. 12); with the usual supply of slender spines each arising from a minute tubercle. Epigynum: quite distinctive; with a short, median scape; essentials shown in Figure 13; dissection reveals a pair of conspicuously coiled spermathecae not seen in external appearance. Color in alcohol: generally much lighter than in male; first and second legs yellowish with many reddish brown, irregular spots; first and second femora with prolateral surfaces conspicuously reddish brown with many fine, black dots each associated with a stiff bristle or spine; third and fourth legs much lighter; abdomen yellowish brown dorsally with lighter spots and narrow stripes, with alternating light and darker lateral stripes, ventrally with a broad, dark brown, median stripe.

*Type locality.* Male holotype and female paratype from Gamboa, Panama Canal Zone, July, 1954. Paratypes of both sexes collected at the following localities in the Canal Zone: Summit, August, 1950; Summit Gardens, August and July, 1954; Gamboa, July and August, 1954 and January, 1958; Corozal, July, 1954 and December, 1957; Balboa, May, 1964.

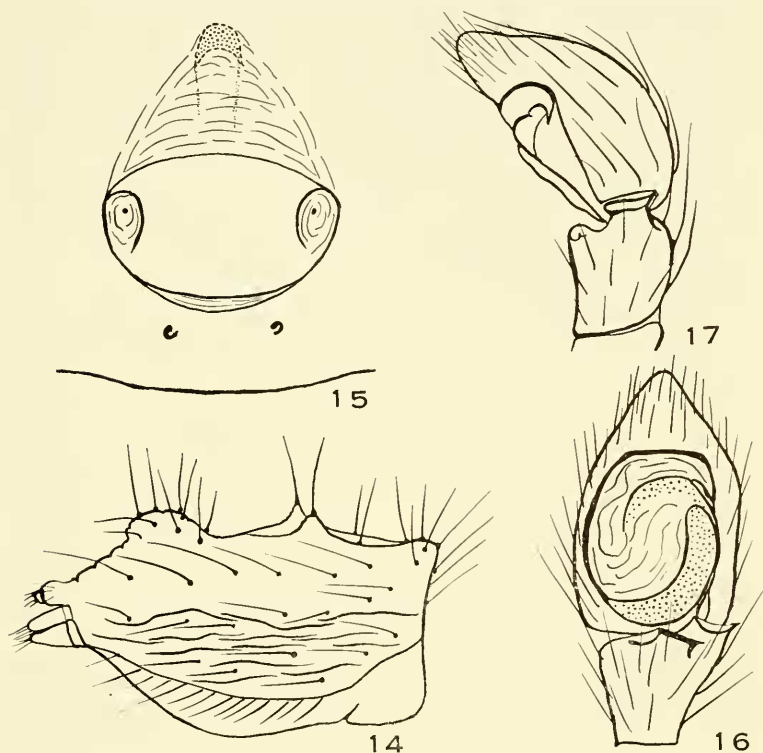
TMARUS IMPEDUS sp. nov.

Figures 14-15

The name of the species is an arbitrary combination of letters.

*Female holotype.* Total length, including the somewhat porrect chelicerae, 6.11 mm. Carapace 2.41 mm long; 2.34 mm wide opposite posterior border of second coxae where it is widest; 0.72 mm tall and, therefore, only one-third as tall as wide; ventral margin regularly rounded from opposite PLE to posterior border; other features as usual in females of the genus from Panama. Eyes: viewed from above, posterior row moderately recurved, anterior row slightly so; viewed from in front, anterior row nearly straight, measured by centers; central ocular quadrangle wider behind than in front in ratio of 4 : 3, wider behind than long in ratio of about 10 : 9. Ratio of eyes AME : ALE : PME : PLE = 5 : 12 : 7 : 12. AME separated from one another by 3.6 times

their diameter, from ALE by nearly four times their diameter; PME separated from one another by nearly four times their diameter, from PLE by nearly five times their diameter; laterals separated by slightly more than 2.5 times their diameter. Clypeus quite porrect; height, including membranous ventral border, nearly equal to 8.5 times the diameter of AME; with the usual slender spines. Chelicerae, maxillae, and lip, all essentially typical of females of the genus from Panama. Sternum: scutiform; moderately convex; longer than wide in ratio of 5 : 4; widest between second coxae; with many bristles; not extended between



*Tmarus impedus* sp. nov.

Fig. 14. Abdomen of female, lateral view, right side.

Fig. 15. Epigynum, from below.

*Tmarus innotus* sp. nov.

Fig. 16. Tibia and tarsus of left male palp, ventral view.

Fig. 17. Tibia and tarsus of left male palp, retrolateral view.

fourth coxae which are separated by slightly more than half their width. Legs: 1243; with numerous spines. Abdomen: very spiny; anterior, dorsal border slightly raised; slightly anterior to middle of dorsum a pair of small, conical tubercles arise, each topped by a fairly robust spine; a little behind the middle of the dorsum is a low tubercle bearing numerous spines (Fig. 14). Epigynum: somewhat distinctive (Fig. 15). Color in alcohol: the carapace has a triangular area which is yellow or whitish with small, irregular, light, reddish brown dots and spots extending from PLE to the top of the posterior declivity; from the top of the declivity a series of radiating, irregular, whitish lines extend downward over a yellowish brown background; legs yellowish with many reddish spots; prolateral surfaces of first two pairs of femora mottled with white spots; mouth parts yellowish; sternum light yellowish; abdomen with dorsum and dorsolateral sides a conglomerate of reddish spots together with irregular, whitish spots, streaks, and numerous black dots; the pair of small dorsal tubercles are largely black; venter with a median, light brownish stripe flanked on each side by an irregularly dotted white area. It seems probable that there would be much variation in the color pattern of a large population of the species.

*Type locality.* The holotype female is from Summit, Panama Canal Zone, August, 1950. No paratypes have appeared in my collection and the male is unknown.

#### TMARUS INEPTUS O. P.-Cambridge

*Tmarus ineptus* O. P.-Cambridge, 1892, *Arachnida-Araneida*, 1: 94, pl. 13, fig. 3. The holotype female is in the British Museum (Natural History). F. P.-Cambridge, 1900; Chickering, 1950; Roewer, 1954; Bonnet, 1959.

The specimens which I have assigned to this species appear to represent the most abundant of all of the species now known from Panama. I have it from many localities in the Panama Canal Zone and in Panama proper. The P.-Cambridges had the species only from Bugaba, Panama. A comparison of the figures published by the two P.-Cambridges, together with an examination of the single female on loan from the British Museum (Natural History) and the specimens in my own collection, poses serious questions regarding my previous treatment of the species. The two P.-Cambridges represented the epigynum quite differently in their respective illustrations. It now seems quite possible that it will be necessary to recognize the species in my collection as a new species. Until I have an opportunity to study all of the specimens now in the



P.-Cambridge collection and, if possible, to collect in the vicinity of Bugaba I do not think it advisable to take a more positive stand in regard to the matter.

TMARUS INNOTUS sp. nov.

Figures 16-17

The name of the species is an arbitrary combination of letters.

*Male holotype.* Total length, including somewhat porrect chelicerae, 2.8 mm. Carapace 1.1 mm long; 1.08 mm wide; 0.54 mm tall. Eyes: viewed from above, posterior row quite strongly recurved, anterior row moderately so; viewed from in front, anterior row slightly procurved, measured by centers; central ocular quadrangle wider behind than in front in ratio of 26 : 17, wider behind than long in ratio of 13 : 12; posterior row occupies about seven-tenths of width of carapace. Ratio of eyes AME : ALE : PME : PLE = 4 : 8 : 5 : 8. AME separated from one another by 2.5 times their diameter, from ALE by 2.75 times their diameter; PME separated from one another by 3 times their diameter, from PLE by slightly more than this; laterals separated by 2.25 times their diameter. Clypeus: with a long, slender spine on each side beneath interval separating AME from ALE; height equal to 4 times the diameter of AME (membranous ventral border not included). Chelicerae, maxillae, lip and sternum all essentially typical of males of the genus from Panama. Legs: 1243. Palp: exposed parts much simpler than usual in the genus from Panama; tibial apophyses unlike others seen by me; distinguishing features shown in Figures 16-17. Abdomen: a little more than twice as long as wide; posterior end somewhat extended; with a small but distinct dorsal tubercle probably indicating that the female has a well developed posterodorsal tubercle extending above the spinnerets. Color in alcohol: lateral sides of carapace a mottled, medium reddish brown; clypeus and ocular region yellowish with numerous light brown spots; dorsal area of carapace with a somewhat triangular, yellowish area with apex extending just over the top of the posterior declivity and including brownish spots of different sizes and form; mouth parts and sternum yellowish with variations. First and second femora with irregular, whitish spots on prolateral surfaces; first and second metatarsi reddish. Abdomen with an irregular whitish stripe in middorsal region; remainder of dorsum and lateral regions yellowish with minute reddish dots at bases of numerous spines; venter yellowish white.

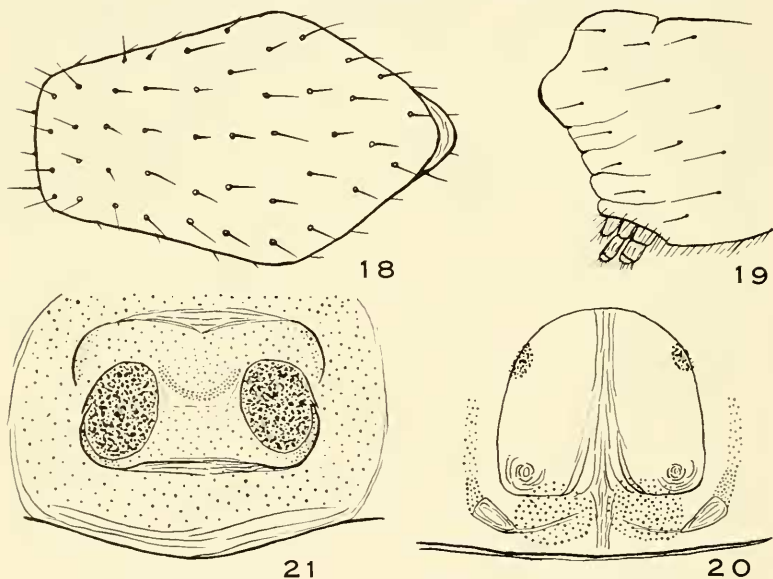
*Type locality.* Male holotype from Barro Colorado Island, Panama Canal Zone, July 30, 1954. There are no paratypes and the female is unknown.

*Tmarus innumus* sp. nov.

Figures 18-20

The name of the species is an arbitrary combination of letters.

*Female holotype.* Total length, including slightly porrect chelicerae, 9.95 mm. Carapace 3.25 mm long, 2.89 mm wide, 1.37 mm tall. Eyes: viewed from above, posterior row moderately recurved, anterior row slightly so; viewed from in front, anterior row nearly straight, measured by centers; central ocular quadrangle wider behind than in front in ratio of about 4 : 3; wider behind than long in the same ratio. Ratio of eyes AME : ALE : PME : PLE = 8 : 16 : 9.5 : 14. AME separated from one another by four times



*Tmarus innumus* sp. nov.

Fig. 18. Abdomen of female, dorsal view.

Fig. 19. Posterior end of abdomen of female, lateral view, right side.

Fig. 20. Epigynum, seen from below.

*Tmarus levii* sp. nov.

Fig. 21. Epigynum, seen from below.

their diameter; from ALE by slightly less than this. PME separated from one another by about five times their diameter; from PLE by nearly six times their diameter. Laterals separated by twice the diameter of ALE. Clypeus: moderately porrect; height, including membranous ventral border, equal to nearly nine times the diameter of AME. Chelicerae, maxillae, and lip all essentially typical of females of the genus from Panama. Sternum: typical of females of the genus from Panama; not extended between fourth coxae which are separated by two-fifths of their width. Legs: 2143; spines on first and second metatarsi shorter, more robust, and more numerous than usual in females from Panama. Epigynum somewhat distinctive as shown in Figure 20. Carapace brownish with three pairs of narrow stripes radiating over lateral sides; posterior declivity yellowish at top but dark brown elsewhere; a small brown circular area surrounds each PME. Sternum light brown. Legs yellowish with many black or gray dots and spots; first and second femora conspicuously dotted with black on prolateral and ventral surfaces; first patellae nearly black ventrally. Abdomen conspicuously chalky white dorsally with irregular, blackish bars and spots in posterior half; lateral sides irregularly white with brown spots and irregular oblique rows of black dots and short bars; venter with a light brown, median stripe flanked on each side by a row of brownish dots.

*Type locality.* Female holotype from Summit Gardens, Panama Canal Zone, July 19, 1954; one female paratype from Summit, C. Z., July 21, 1950. Epigynum of paratype slightly different from that of the holotype but not significantly so in my judgment. The male is unknown.

#### TMARUS INTENTUS O. P.-Cambridge

*Tmarus intentus* O. P.-Cambridge, 1892, *Arachnida-Araneida*, 1: 96, pl. 13, fig. 1. The holotype male from Guatemala and the female from Bugaba, Panama, are in the British Museum (Natural History). F. P.-Cambridge, 1900; Chickering, 1950; Roewer, 1954; Bonnet, 1959.

This appears to be a rare species in regions where I have collected. It has not appeared in my collections since 1936 when I took two females on Barro Colorado Island in July. Some uncertainties appear to exist in respect to this species, however. Two females on loan from the British Museum (Natural History) differ quite markedly in general appearance although the epigyna are closely similar. I hope to be able to study all specimens regarded by the P.-Cambridges as belonging to this species and, if possible, to collect in regions from which the species has been reported.

## TMARUS LEVII sp. nov.

## Figure 21

This species is named after Dr. Herbert W. Levi, Associate Curator of Arachnology, Museum of Comparative Zoology, Harvard University.

*Female holotype.* Total length, including bases of chelicerae, 6.37 mm. Carapace 2.4 mm long; 2.05 mm wide; about 0.98 mm tall; without a distinct thoracic groove; with numerous minute tubercles each with a long, slender spine. Eyes: viewed from above, posterior row moderately recurved, anterior row only slightly so; viewed from in front, anterior row slightly procurved, measured by centers. Central ocular quadrangle wider behind than in front in ratio of 25 : 18; wider behind than long in nearly the same ratio. Ratio of eyes AME : ALE : PME : PLE = 7 : 10.5 : 6.5 : 10. AME separated from one another by about 3.5 times their diameter, from ALE by about three times their diameter. PME separated from one another by nearly six times their diameter, from PLE by slightly less. Laterals separated by about three times the diameter of PLE. Clypeus: with a row of six spines along ventral border and with numerous bristles turned toward the middle line; height equal to nearly eight times the diameter of AME, including ventral membranous border. Chelicerae, maxillae, and lip all essentially typical of females of the genus from Panama. Sternum not extended between fourth coxae which are separated by slightly less than one-third of their width. Legs: 1243; spines essentially as usual in females of the genus from Panama; trichobothria observed on tibiae, metatarsi, tarsi and also on palpal tibiae. Abdomen: anterior border with a row of slender spines; dorsal surface with many slender spines, all apparently erectile. Distinctive features of epigynum shown in Figure 21. Carapace yellowish with light brown stripes radiating irregularly from region just above beginning of posterior declivity together with numerous brownish streaks and spots; posterior declivity light brownish with nearly white, irregular border. Clypeus yellowish with many reddish brown dots. Sternum, lip and maxillae all yellowish. Legs yellowish with many reddish dots at bases of spines; first and second femora conspicuously dotted with red on a white background along prolateral surfaces. Abdomen: dorsum whitish with many fine, dark dots and many larger, reddish dots at bases of spines; venter whitish along a broad, central stripe and darker laterally with conspicuous, narrow grooves and semitransparent dots.

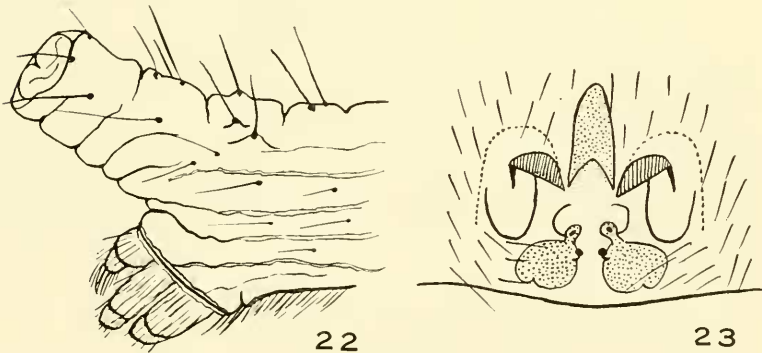
*Type locality.* Female holotype from Barro Colorado Island, Panama Canal Zone, June, 1950. There are no paratypes and the male is unknown.

*TMARUS LONGUS* sp. nov.

Figures 22-23

The name of the species is a Latin adjective meaning extended, suggested by the conspicuous posterior extension of the abdomen.

*Female holotype.* Total length 5.33, including somewhat porrect chelicerae. Carapace 1.67 mm long; 1.36 mm wide; 0.64 mm tall. Eyes: viewed from above, posterior row moderately recurved, anterior row slightly so; viewed from in front, anterior row slightly recurved, measured by centers; central ocular quadrangle wider behind than in front in ratio of 5 : 3, wider behind than long in ratio of 15 : 14; posterior row occupies about two-thirds of width of carapace at that level. Ratio of eyes AME : ALE : PME : PLE = 4 : 11 : 5.5 : 10. AME separated from one another by slightly less than three times their diameter, from ALE by slightly less than four times their diameter; PME separated from one another by nearly 3.5 times their diameter, from PLE by nearly five times their diameter; laterals separated by nearly twice the diameter of ALE. Clypeus: moderately porrect; with a row of seven spines near ventral margin with the second from each end being very long; height equal to about 7.5 times the diameter of AME. Chelicerae, maxillae, and lip essentially typical of females of the genus from Panama. Sternum quite convex; with many long, stiff bristles; not



*Tmarus longus* sp. nov.

- Fig. 22. Posterior end of abdomen, lateral view, right side.  
 Fig. 23. Epigynum, seen from below.

extended between fourth coxae which are separated by five-thirteenths of their width. Legs: 1243; first two pairs of legs unusually long; spines are few in number and less conspicuous than usual in the genus from Panama. Abdomen long and slender; posterior end conspicuously extended (Fig. 22); with many spines. Epigynum complicated; with some parts quite obscure; unlike any other seen by the author (Fig. 23). Carapace with a somewhat triangular, yellowish area extending from PLE to top of posterior declivity which has a narrow white boundary and an incomplete, white, longitudinal line through the middle; dorsolateral sides light brownish with white lines and streaks extending ventrally in somewhat radiate fashion; a fairly broad, white, longitudinal band extends along lateral sides; ocular area whitish with a pair of short, yellowish, longitudinal stripes between PME. Palps and chelicerae a mixture of yellowish and white; other mouth parts yellowish. First two pairs of legs whitish with brown dots and larger spots, the latter concentrated along prolateral surfaces of first two pairs of femora; third and fourth legs yellowish with few reddish brown dots and larger spots. Abdomen: with a fairly well defined folium bounded laterally by an irregular, narrow, brown stripe extending through about three-fourths of length of abdomen; lateral and ventrolateral sides yellowish white with several narrow, longitudinal folds; venter yellowish with a narrow, irregular, whitish, ventrolateral border on each side.

*Type locality.* Holotype female from Panama Canal Zone Forest Preserve, Panama Canal Zone, July, 1954; one immature paratype taken in the same locality, January, 1958; the male is unknown.

#### TMARUS MOROSUS Chickering

*Tmarus morosus* Chickering, 1950, Bull. Mus. Comp. Zool., 103(4): 235, figs. 13-15. The male holotype and the female paratype are in the Museum of Comparative Zoology. Roewer, 1954; Bonnet, 1959.

The holotype is from Barro Colorado Island, Panama Canal Zone; the female paratype is from the Madden Dam region, C. Z.; paratypes are in the collection from Barro Colorado Island, C. Z. Forest Preserve, Summit Gardens, Fort Sherman, and Chilibre, all in the Canal Zone.

#### TMARUS MUNDULUS O. P.-Cambridge

*Tmarus mundulus* O. P.-Cambridge, 1892, Arachnida-Araneida, 1: 95, pl. 12, fig. 11. The holotype female from Bugaba, Panama, is in the British Museum (Natural History). F. P.-Cambridge, 1900; Chickering, 1950; Roewer, 1954; Bonnet, 1959.

The P.-Cambridges had only females. What are believed to be both sexes have appeared in my collection in large numbers from many localities in the Canal Zone.

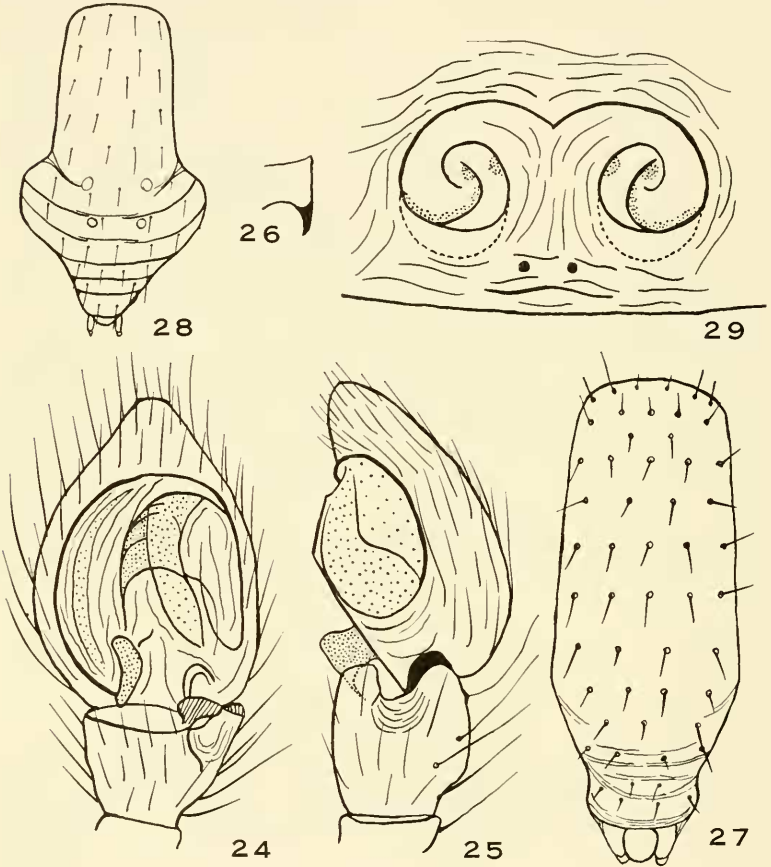
TMARUS OBSECUS sp. nov.

Figures 24-29

In spite of some lingering uncertainties it is regarded as fairly safe to match the sexes as they are presented below. The name of the species is an arbitrary combination of letters.

*Male holotype.* Total length, including bases of chelicerae, 4.49 mm. Carapace: 1.54 mm long; 1.32 mm wide; 0.57 mm tall. Eyes: viewed from above, posterior row rather strongly recurved, anterior row moderately so, not including strongly convex lenses; viewed from in front, anterior row very slightly procurved, measured by centers. Central ocular quadrangle wider behind than in front in ratio of 30 : 21; wider behind than long in ratio of 15 : 13. PLE extend somewhat beyond lateral margins of carapace at their level. Ratio of eyes AME : ALE : PME : PLE = 6 : 11 : 5 : 9. AME separated from one another by 11/6 of their diameter, from ALE by 7/3 of their diameter. PME separated from one another by four times their diameter, from PLE by slightly more than five times their diameter. Height of clypeus, including membranous ventral border, equal to 3.5 times the diameter of AME. Chelicerae, maxillae and lip typical of males of the genus in Panama. Sternum only slightly convex; posterior end bluntly pointed but not extended between fourth coxae which are separated by nearly one half their width. Legs: 1243. Palp: distinctive features shown in Figures 24-26; both tibial apophyses short, blunt. Abdomen: elongated; lateral sides nearly parallel throughout two-thirds of length and then sharply narrowed; a slight widening just before constriction is taken to indicate a tendency to inflate as in the female. Carapace with steep posterior declivity a fairly uniform brown; radiating from top of posterior declivity are several irregular, yellowish and brown stripes covering most of dorsal surface and extending laterally to make a complicated color pattern; clypeus a dark brown; anterior surface of chelicerae brownish with yellowish stripes. Sternum brown with elongated darker spots extending toward center from margin. Legs generally light brown with many irregular, reddish and yellowish spots; first femora with a dark brown stripe along prolateral surface; second femora with a similar stripe but much broken into separate spots; third and fourth legs much lighter. Abdomen: dorsum brownish

in general but this results from a conglomeration of brown streaks and spots on a light yellowish background; a median lighter streak extends through the entire length of the dorsum; lateral sides with narrow rows of elongated, brown spots and streaks alternating with yellowish streaks; venter with a broad, brownish, median, longitudinal stripe flanked on each side by a narrower yellowish stripe.



*Tmarus obsecus* sp. nov.

- Fig. 24. Tibia and tarsus of left male palp, ventral view.  
 Fig. 25. Tibia and tarsus of left male palp, retrolateral view.  
 Fig. 26. Basal, palpal, tarsal apophysis, prolateral view.  
 Fig. 27. Abdomen of male, dorsal view.  
 Fig. 28. Abdomen of female, dorsal view.  
 Fig. 29. Epigynum, seen from below.



*Female paratype.* Total length, including somewhat extended chelicerae, 8.13 mm. Carapace 2.47 mm long; 2.2 mm wide; about 0.98 mm tall. Eyes: viewed from above, posterior row moderately recurved, anterior row slightly so; viewed from in front, anterior row straight, measured by centers. Central ocular quadrangle wider behind than in front in ratio of about 3 : 2; wider behind than long in about the same ratio. Ratio of eyes AME : ALE : PME : PLE = 6 : 13 : 8 : 11. AME separated from one another by slightly more than three times their diameter, from ALE by about 3.5 times their diameter. PME separated from one another by slightly more than four times their diameter, from PLE by about 4.75 times their diameter. Laterals separated by nearly twice the diameter of PLE. Clypeus quite porrect; ventral margin with numerous spines (some indicated only by scars); height, including membranous ventral border, equal to slightly more than six times the diameter of AME. Chelicerae, maxillae and lip typical of females of the genus from Panama. Sternum moderately convex; not extended between fourth coxae which are separated by a little more than one-sixth of their width. Legs: 1243. Abdomen: inflated laterally in posterior half as shown in Figure 28. Carapace reddish brown with several narrow, yellowish lines and reddish brown bands radiating from top of posterior declivity; lateral sides irregularly spotted with reddish brown on a yellowish background; steep posterior declivity nearly all reddish brown. Chelicerae brownish with a yellowish stripe along median boundary. Lip brown, lighter at distal end. Maxillae yellowish in general but brownish in median halves. Sternum brown. First and second legs brownish in general with irregular yellowish spots; femora of these legs with a broad, brown, prolateral stripe throughout; third and fourth legs much lighter with the femora also with a broad, prolateral stripe much lighter in color. Abdomen: dorsum dark colored with many small, red dots and larger reddish spots; extending through the middle of the anterior half of the dorsum is a narrow, irregular, dark stripe fringed with yellow; this is continued to the anal tubercle by a broken, median yellow stripe; the inflated region has a broken, yellow bar extending across and down the lateral sides; lateral sides with a series of narrow, alternating, black and reddish, longitudinal stripes; venter with a fairly broad, median, longitudinal, light brown stripe flanked on each side by a broader, yellow stripe with dark, irregular dots.

*Type locality.* Male holotype from Summit, Panama Canal Zone, August, 1950; female paratype from Barro Colorado Island, C. Z., January, 1958; one immature female paratype from Summit, C. Z., November, 1946 (N. L. H. Kraus).

## TMARUS PARKI Chickering

*Tmarus parki* Chickering, 1950, Bull. Mus. Comp. Zool., 103(4): 242, figs. 19-20. The male holotype from Barro Colorado Island, Panama Canal Zone, is in the Museum of Comparative Zoology. Roewer, 1954; Bonnet, 1959.

One additional male of this species was taken on Barro Colorado Island, C. Z., January, 1958. This specimen has a much brighter color pattern than was shown by the holotype; the carapace is brightly colored somewhat like that of *T. decorus* sp. nov.; the dorsum of the abdomen has each spine arising from a red dot surrounded by a yellowish ring. The female is unknown.

## TMARUS PAUPER O. P.-Cambridge

*Tmarus pauper* O. P.-Cambridge, 1892, Arachnida-Araneida, 1: 96, pl. 12, fig. 8. The male holotype is in the British Museum (Natural History). F. P.-Cambridge, 1900; Chickering, 1950; Roewer, 1954; Bonnet, 1959.

The P.-Cambridges had only the male from Bugaba, Panama. The species has not yet appeared in my collections and, so far as I know, has not been reported since the original collections were made.

## TMARUS PEREGRINUS Chickering

*Tmarus peregrinus* Chickering, 1950, Bull. Mus. Comp. Zool., 103(4): 245, figs. 21-22. The male holotype is in the Museum of Comparative Zoology. Roewer, 1954; Bonnet, 1959.

The male holotype was taken on Barro Colorado Island, Panama Canal Zone, July, 1934 and has not appeared in my collections since that time. The female is unknown.

## TMARUS PROBUS Chickering

*Tmarus probus* Chickering, 1950, Bull. Mus. Comp. Zool., 103(4): 247, figs. 23-24. The male holotype together with several paratype males from several different localities in the Panama Canal Zone and Panama proper are in the Museum of Comparative Zoology. Roewer, 1954; Bonnet, 1959.

The species has been collected on four different dates since the publication of my paper in 1950, and all within the Canal Zone. Dr. James Zetek contributed a specimen taken in El Cermeno, Panama, January, 1940.

## TMARUS PRODUCTUS Chickering

*Tmarus productus* Chickering, 1950, Bull. Mus. Comp. Zool., 103(4): 249, figs. 25-26. The male holotype from Porto Bello, Panama, is in the Museum of Comparative Zoology. Roewer, 1954; Bonnet, 1959.

The species has appeared in my collections only twice in recent years: Summit, July, 1950, and Summit Gardens, July, 1954, Panama Canal Zone. It seems possible that the female *T. impudus* sp. nov. is the missing female for this species.

## TMARUS PROTOBIUS sp. nov.

## Figure 30

The name for this species is an arbitrary combination of letters.

*Female holotype.* Total length 5.46 mm, including somewhat porrect chelicerae. Carapace 1.65 mm long; 1.36 mm wide; 0.77 mm tall. Eyes: viewed from above, posterior row rather strongly recurved, anterior row moderately so, exclusive of the very convex lenses of ALE; viewed from in front, anterior row gently pro-curved, measured by centers. Central ocular quadrangle wider behind than in front in ratio of 29 : 19; slightly wider than long. Ratio of eyes AME : ALE : PME : PLE = 4.5 : 11.5 : 7 : 10.5. AME separated from one another by slightly more than twice their diameter, from ALE by a little more than three times their diameter. PME separated from one another by about 2.5 times their diameter, from PLE by a little more than 3.5 times their diameter. Laterals separated by twice the diameter of PLE. Clypeus: moderately porrect; height, including membranous ventral border, nearly six times the diameter of AME. Chelicerae, maxillae, and lip essentially typical of females of the genus from Panama. Sternum: moderately convex; posterior end sharply pointed, not extended between fourth coxae which are separated by five-thirteenths of their width. Legs: 1243. Abdomen: with a well defined posterodorsal tubercle. Epigynum: somewhat distinctive (Fig. 30); quite unlike that seen in any other species known to me. Carapace in general light yellowish but with irregular, brownish lines radiating from a central light colored region out over dorso-lateral sides; posterior declivity light brownish in center and light yellowish on lateral sides. Chelicerae: each with a narrow, light yellowish, lateral stripe and with anterior surface a mixture of irregular light lines and light brownish spots. Other mouth parts yellowish. Sternum: yellowish with an irregular row of red dots along each lateral region. Legs: in general yellowish with many

reddish dots, white spots and streaks; first femora with an irregular, prolateral, brown stripe with red dots and streaks along margins; second femora with a whitish, prolateral stripe and many red dots; ventral surfaces of segments from patellae to tarsi are similarly but less conspicuously colored. Abdomen: with a dorsal, light brownish folium bordered by narrow, white lines; lateral sides whitish with fine dots arranged in irregular, longitudinal lines; ventrolaterally there is a series of light brownish, irregular, narrow stripes; venter light yellowish with a pair of dotted lines close to midventral region and a single dotted line on each side near the lateral border.

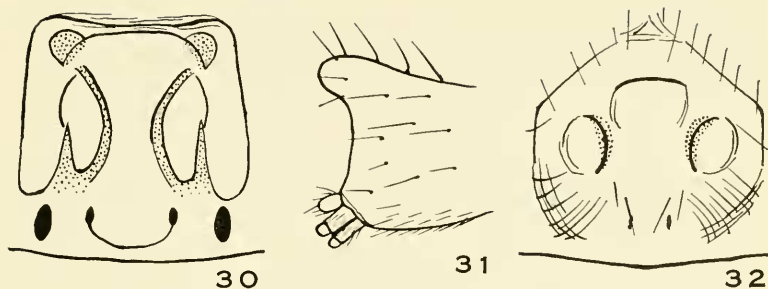
*Type locality.* Holotype female from Barro Colorado Island, Panama Canal Zone, August, 1950. One paratype female from Summit Gardens, C. Z., July, 1954. The male is unknown.

TMARUS RUBINUS sp. nov.

Figures 31-32

The name of the species is an arbitrary combination of letters.

*Female holotype.* Total length, including somewhat porrect chelicerae, 6.11 mm. Carapace 1.96 mm long; 1.69 mm wide; about 0.98 mm tall. Eyes: viewed from above, posterior row moderately recurved, anterior row gently so; viewed from in front, anterior row probably straight (raised cuticle makes it difficult to measure accurately). Central ocular quadrangle wider behind than in front in ratio of about 3 : 2; wider behind than long in ratio of about 4 : 3. Posterior row of eyes occupies about five-sixths of width of carapace. Ratio of eyes AME : ALE : PME : PLE = 5.5 : 12.5 : 7.5 : 10. AME separated from one another by slightly more than three times their diameter, from ALE by about the same distance. PME separated from one another by slightly less than four times their diameter, from PLE by about the same distance. Laterals separated by 1.8 times the diameter of PLE. Clypeus moderately porrect; height equal to about six times the diameter of AME. Chelicerae, maxillae, and lip essentially typical of females of the genus from Panama. Sternum: only slightly convex; not extended between fourth coxae which are separated only by about one-fifth of their width. Legs: 1 = 234. Abdomen: with posterodorsal tubercle quite conspicuously developed (Fig. 31); otherwise essentially typical of females of the genus from Panama. Epigynum: obscurely distinctive; essentials shown in Figure 32. Carapace light brownish in general with whitish spots and streaks; dorsal radiations, so conspicuous in several species, are here obscure and poorly defined; posterior declivity with a whitish spot



*Tmarus protobius* sp. nov.

Fig. 30. Epigynum, seen from below.

*Tmarus rubinus* sp. nov.

Fig. 31. Posterior end of abdomen of female, lateral view, right side.

Fig. 32. Epigynum, seen from below.

at top with remainder a variable brownish. Sternum light yellowish. Legs: yellowish in general with many small, reddish brown spots; first two pairs of femora conspicuously mottled with reddish brown along the whole prolateral surface; dorsal and lateral surfaces of abdomen light yellowish with many small, reddish and whitish dots, irregular spots and streaks; venter with a broad, unicolorous, yellowish, median stripe; lateral sides of the median stripe irregularly whitish.

*Type locality.* Female holotype from Summit Gardens, Panama Canal Zone, July, 1954. There are no paratypes and the male is unknown.

#### TMARUS SIGILLATUS Chickering

*Tmarus sigillatus* Chickering, 1950, Bull. Mus. Comp. Zool., 103(4): 252, figs. 27-28. The male holotype from the Panama Canal Zone Forest Preserve, C. Z., is in the Museum of Comparative Zoology. Roewer, 1954; Bonnet, 1959.

Several males have been added to the collection from Summit, C. Z. Forest Preserve, and Summit Gardens, all in the Canal Zone and all taken during the past fourteen years. The female remains unknown.

#### TMARUS STUDIOUS O. P.-Cambridge

*Tmarus studiosus* O. P.-Cambridge, 1892, Arachnida-Araneida, 1:97, pl. 12, fig. 6. Types of both sexes are in the British Museum (Natural History), from Bugaba, Panama. F. P.-Cambridge, 1900; Chickering, 1950; Roewer, 1954; Bonnet, 1959.

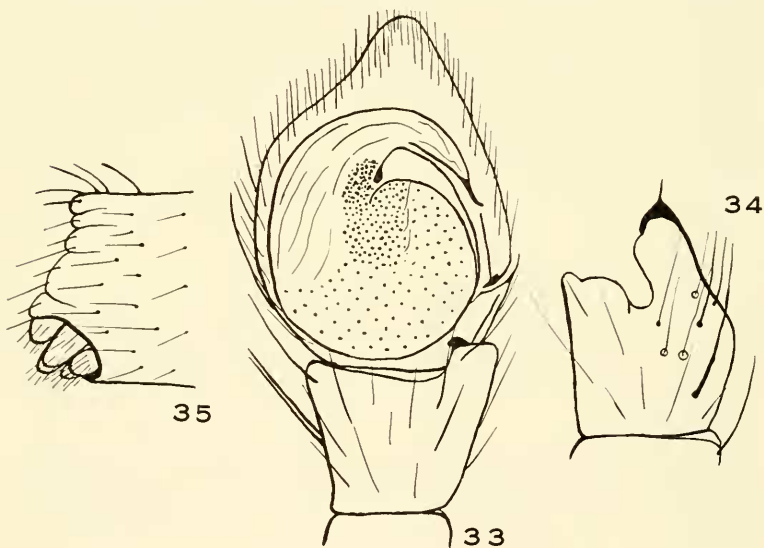
The collection now includes both sexes of this species from many localities in the Canal Zone where it appears to be abundant.

*Tmarus vitusus* sp. nov.

Figures 33-35

The name of the species is an arbitrary combination of letters.

*Male holotype.* Total length 4.68 mm. Carapace 1.76 mm long; 1.69 mm wide; about 0.68 mm tall. Eyes: viewed from above, posterior row quite strongly recurved, anterior row gently so (exclusive of very convex lenses of ALE); viewed from in front, anterior row almost straight, measured by centers. Central ocular quadrangle wider behind than in front in ratio of 10 : 7; wider behind than long in ratio of 5 : 4. Posterior row of eyes occupies nearly full width of carapace. Ratio of eyes AME : ALE : PME : PLE = 5 : 11 : 7 : 10. AME separated from one another by 3.6 times their diameter, from ALE by three times their diameter, PME separated from one another by 3.7 times their diameter, from PLE by slightly more than 4.4 times their diameter. Laterals



*Tmarus vitusus* sp. nov.

Fig. 33. Left palp of male, ventral view.

Fig. 34. Left palpal tibia, retrolateral view.

Fig. 35. Posterior end of abdomen, lateral view.

separated by 2.5 times the diameter of PLE. Clypeus: with a row of six long, slender spines near ventral border and a single similar, medial spine below the interval separating AME. Chelicerae, maxillae, and lip essentially typical of males of the genus from Panama. Sternum moderately convex; squarely terminated halfway between fourth coxae which are separated by slightly more than half their width. Legs: 1243. Palp: essential features shown in Figures 33-34. Abdomen: with a small but definite posterodorsal tubercle (Fig. 35), probably indicative of a more or less prominent tubercle in the female of the species. Carapace with a nearly triangular area outlined in yellowish enclosing a brownish region just behind PME; just posterior to the apex of this region is a somewhat rounded, yellowish area reaching a short distance down the posterior declivity; remainder of dorsal region, posterior declivity and lateral sides are a mottled yellowish and brownish color; interocular and clypeal region a dotted, yellowish coloration. Legs yellowish with many brown dots, especially marked on pro-lateral surfaces of femora, patellae, and tibiae of first and second legs. Sternum yellowish with fine, brown, irregular dots. Abdomen: dorsal and lateral sides in general grayish with a darker median streak extending through anterior half and four narrow, darker, cross bars poorly outlined; venter with a rounded, brownish spot in front of genital groove and a median, longitudinal, light brown stripe bordered by very light areas and extending nearly to the spinnerets.

*Type locality.* Male holotype from Gamboa, Panama Canal Zone, July 24, 1954. There are no paratypes and the female is unknown.

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